

Tropical GRIP Forecast Discussion for September 12, 2010

Created 2200 UTC September 10, 2010

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Summary:

The DC-8 and Global Hawk are flying into PGI-44L/AL92 today, while the WB-57 has a no fly day. The main focus is PGI-44L for the next several days. AL92 has not yet developed, and convection is fairly unorganized. There is little evidence of banding features, and any low level circulation is weak at best. However, AL92 remains in a favorable environment with low shear, high SSTs, and high moisture content. Given the conducive environment, it still seems likely that a tropical cyclone could develop within the next couple days. Igor has undergone rapid intensification and is now a strong category 4 hurricane. Igor has a very well defined eye and is very symmetric on satellite imagery. Igor is expected to continue westward for the next 24-48 hours before a turn to the north, and further intensification is possible before it begins to turn. PGI-43L is now TD-12, and is forecast to become Julia within the next 24 hours.

Forecast for 2200 UTC 9/12/2010:

Synoptic Overview:

The main features of concern today are PGI-44L/AL92, Igor, and PGI-43L/TD12. PGI-44L is located at 16.2N/73.5W, Igor is centered at 17.7N/46.9W, and TD-12 is at 13.3N/23.0W (**S1**). A mid latitude low with an accompanying cold front is located in the NW Atlantic. This feature will eventually impact Igor as it acts to break down the subtropical ridge that is currently steering Igor to the west.

Visible and IR imagery indicate the presence of relatively unorganized convection with AL92, as well as off of southwestern Cuba. On the other hand, convection associated with Igor is very well organized, and a well defined eye is present. Convection with TD-12 is not widespread, however, a clear circulation is present, and the convection organized about the center (**S5**). The circulation associated with AL92L over the past few days is less evident today in satellite imagery, and data from the GV seems to support this with no clear circulation evident. Vorticity has weakened at 850mb today with AL92, and has become somewhat elongated orient NE,SW.

At upper levels, the main feature of note is an upper level anticyclone over Hispaniola (**S7 and S8**). Upper level winds are generally weak over the tropics except for outflow associated with Igor. A second anticyclone over the southern US has some 30kt winds on the southeast side. Shear is thus low through most of the Atlantic, with the exception of the northern Gulf of Mexico (**S9**).

Water Vapor and TPW suggest that there is a large amount of moisture available to all 3 systems of interest. SSTs are high through most of the Atlantic, and OHC remains high in the Caribbean (**S11 and S12**).

Features of Interest:

PGI-44L/AL92:

PGI44/AL92 as of 12Z is located at 15.7N/70.7W. Convection has become more organized this morning as the system moves westward at 10 to 15 mph. PGI44 is surrounded by low shear values (**S9**) and high SST's (**S11**), suggesting the system is favorable for development. Dry air is currently northward and eastward appearing to not be ingested into the system as PGI44 moves into the Caribbean (**D4**).

The 1200 UTC models generally moves PGI-44L towards the west-northwest over the next five days (**44A**). It may pass very close or directly over Jamaica between about 24-36 hours, or around 12 UTC Monday to 00 UTC Tuesday. Most of the models then have this making landfall over the Yucatan peninsula in about 72-96 hours, or between 12 UTC Wednesday and 12 UTC Thursday. The ECMWF ensembles concur on the track and timing (**44B**). Afterwards, the system will likely emerge into the southern Gulf of Mexico by late Thursday or early Friday.

The environmental conditions over the next few days appear favorable for development and intensification. PGI-44L is expected to pass over some of the highest heat content over the entire Atlantic basin (**44C**). Currently, PGI-44L is under an upper-level anticyclone (**S8**), and is expected to persist. As a result, the 12 UTC SHIPS model indicates under 10 kts of shear throughout the next five days, and the ECMWF concurs (**S11**). Although some dry air is present to the north and northeast of PGI-44L, there doesn't appear to be enough shear to allow the dry air to the north and northeast to entrain into the pouch over the next five days. Despite these seemingly favorable conditions, the GFS continues to lose the system, while the ECMWF and its ensembles develop this substantially (**44D**). Since the PREDICT dropsondes have been assimilated into the ECMWF and not the other global models, the ECMWF is likely to have the best handle on the system. Most statistical models show gradual intensification until landfall in the Yucatan. Rapid intensification, if it occurs, would be most likely during the period just prior to landfall.

PGI-42/ Igor:

Igor has intensified into a strong category 4 hurricane. The 2100UTC NHC advisory has a center position of 17.7N/46.9W with maximum sustained winds of 120kts. Igor is moving west at 12kts. A very well defined eye has developed, and the system as a whole is very symmetric in appearance (**I1**). Igor has undergone rapid intensification, and the central pressure has dropped 53mb in the past 24 hours. Igor is in a very favorable environment with low shear and high SSTs. Further strengthening is possible, and the NHC forecast is for Igor to reach a max intensity of 135kts. The track is heavily dependent on the interaction of the subtropical ridge with a mid latitude trough located off the eastern US coast. The trough should act to weaken the ridge, allowing Igor to move north. However, the extent of the breakdown is still uncertain. Igor should track to the west for the next 36 hours, followed by a turn to the north (**I2**). A model consensus

brings Igor to 22N/58W in 72 hours and 24N/60W in 96. The majority of the models maintain Igor at a fairly consistent intensity for the next 2 days before gradual weakening, however a few bring it to category 5 intensity (**I3**). Given the environment, it would not be surprising if the intensity is closer to the higher model forecasts than the consensus.

PGI-43:

PGI-43L has just been upgraded to TD-12 at the 1500 UTC advisory. The center was located at 12.7 N, 21.4 W, with sustained winds at 30 kts. The circulation is quite vigorous on visible satellite imagery, and most of the convection is displaced to the west (**S5**) by easterly shear of around 10 kts. TD-12 is currently located within a moist envelope of high TPW (**S6**), with some dry air on the west side originating from northwest Africa.

Most of the models have TD-12 moving in a generally northwest direction over the next five days (**43A**), around the western periphery of a mid-tropospheric ridge over the western Sahara (**43B**). The ECMWF ensembles also show this moving northwestward to a position near 25 N, 40 W in 4-5 days (**43C**). The early development of this storm would also enhance the beta advection effects which would act to pull this storm northwestward. Most models indicate intensification over the next 3 days followed by stabilization (**43D**). Sea surface temperatures are currently around 28C under the center, but are expected to decrease to near 26C by 72 hours, followed by another increase by the end of the 5 day period. The 1200 UTC SHIPS initialized 10 kts of ENE shear over the system, and this shear is projected to remain weak-moderate through 48 hours. Afterwards, the system will encounter strong shear of over 25 kts as a result of a large upper-level low (**43E**). Although a few of the dynamical models do show substantial intensification during the day 4-5 time frame (**43D**), this appears to be an unlikely scenario given the strong shear and marginal sea surface temperatures. Given how far north the projected track is, enhanced interaction with the SAL and dry air are also likely to be negative factors for intensification in a few days.

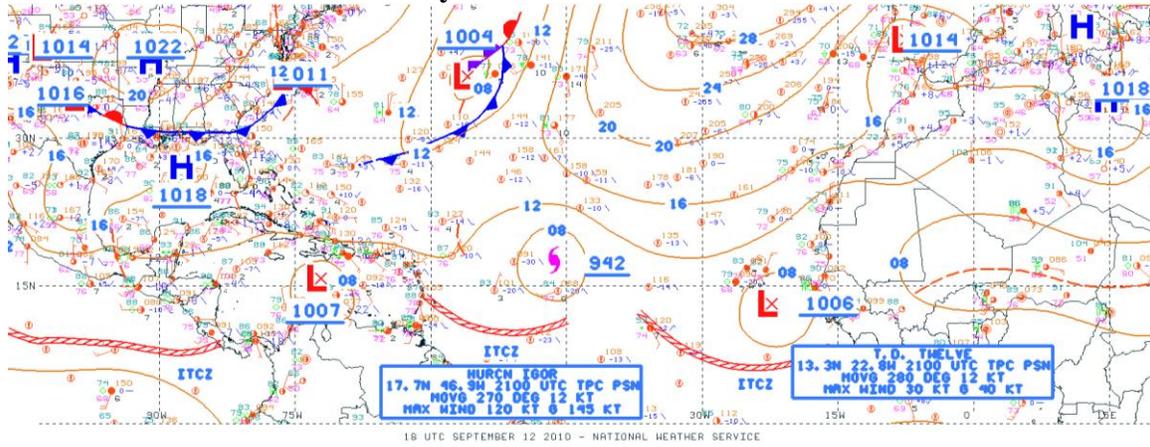
Dust/SAL Discussion:

The most recent SAL outbreak is continuing to move westward off the coast of Africa, wrapping around Igor and persisting northward of PGI43 (**D1**). The GEOS-5 also depicts a plume of dust exiting the western coast of Africa at the 700hPa layer (**D2**) interacting with the areas of interest. The dust layer at upper levels is present in much of the Atlantic basin not yet reaching PGI44 which is currently approaching the Caribbean. GOES-5 forecasts the dust layer at upper and lower levels in the mid-Atlantic to drop to a minimum mid-week. However, an intense plume of aerosols follow and are forecasted to move westward into the Atlantic by the end of next week (**D3 and D4**).

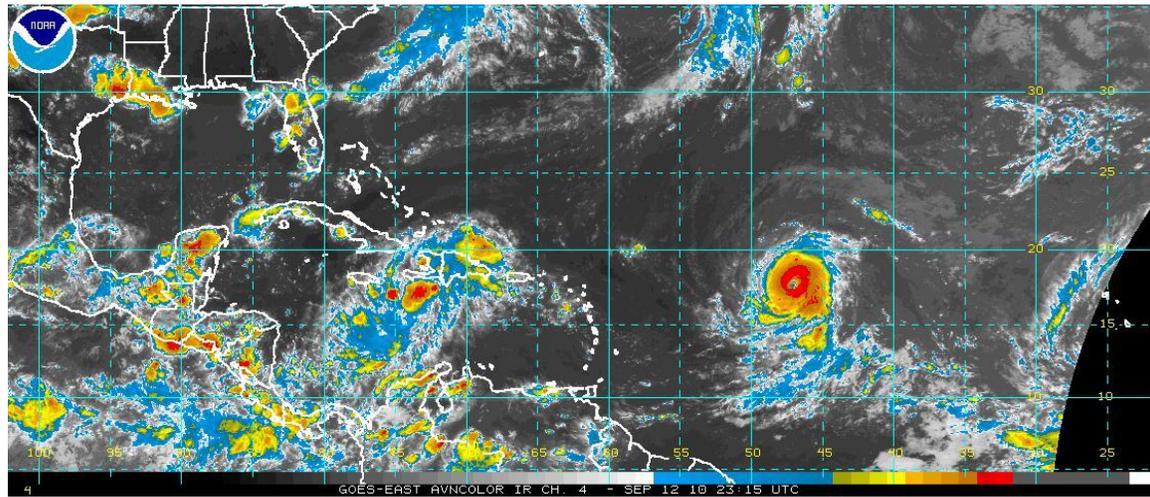
Forecasters: Zelinsky, Nguyen, Thomas

Images used in discussion:

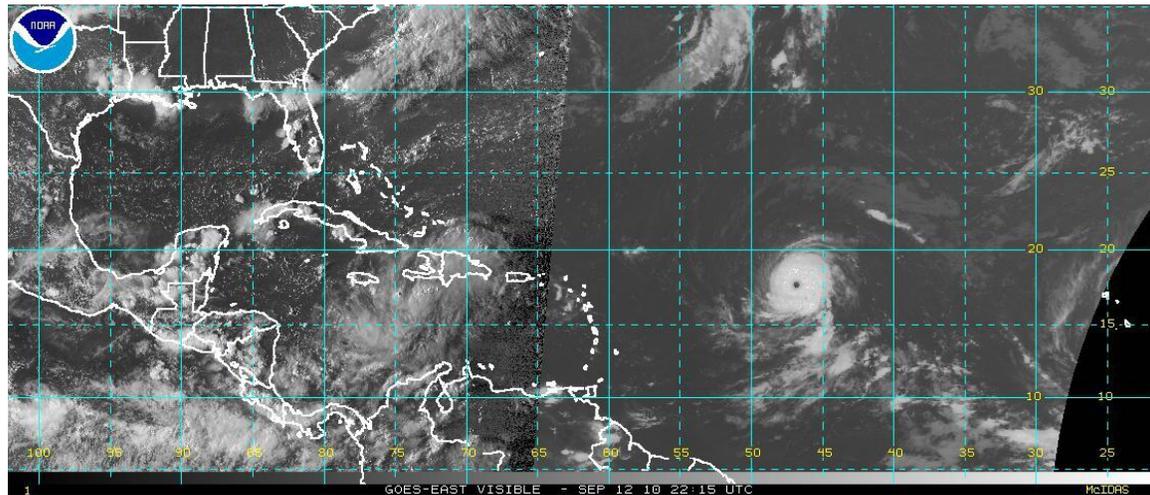
S1-1800UTC OPC Surface Analysis



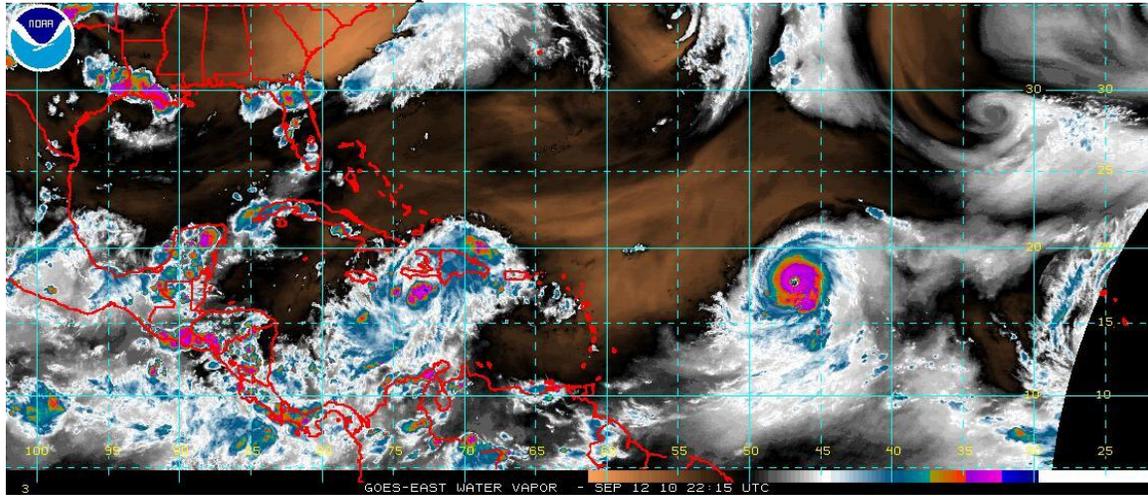
S2-2315UTC GOES IR



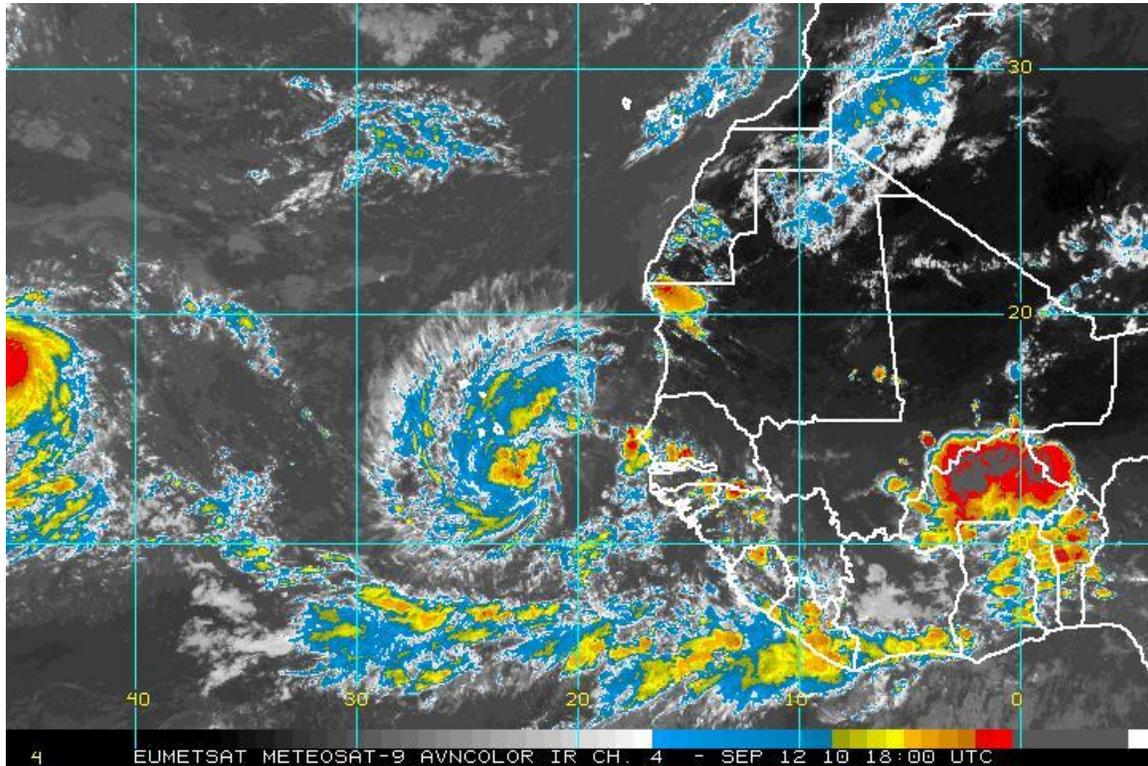
S3-1245UTC GOES Visible



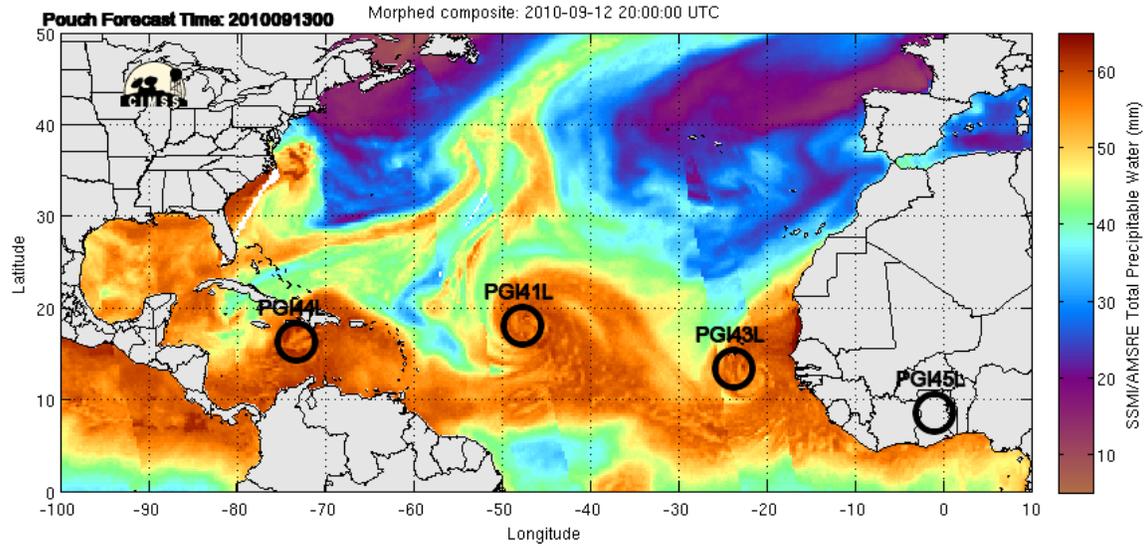
S4-1245UTC GOES Water Vapor



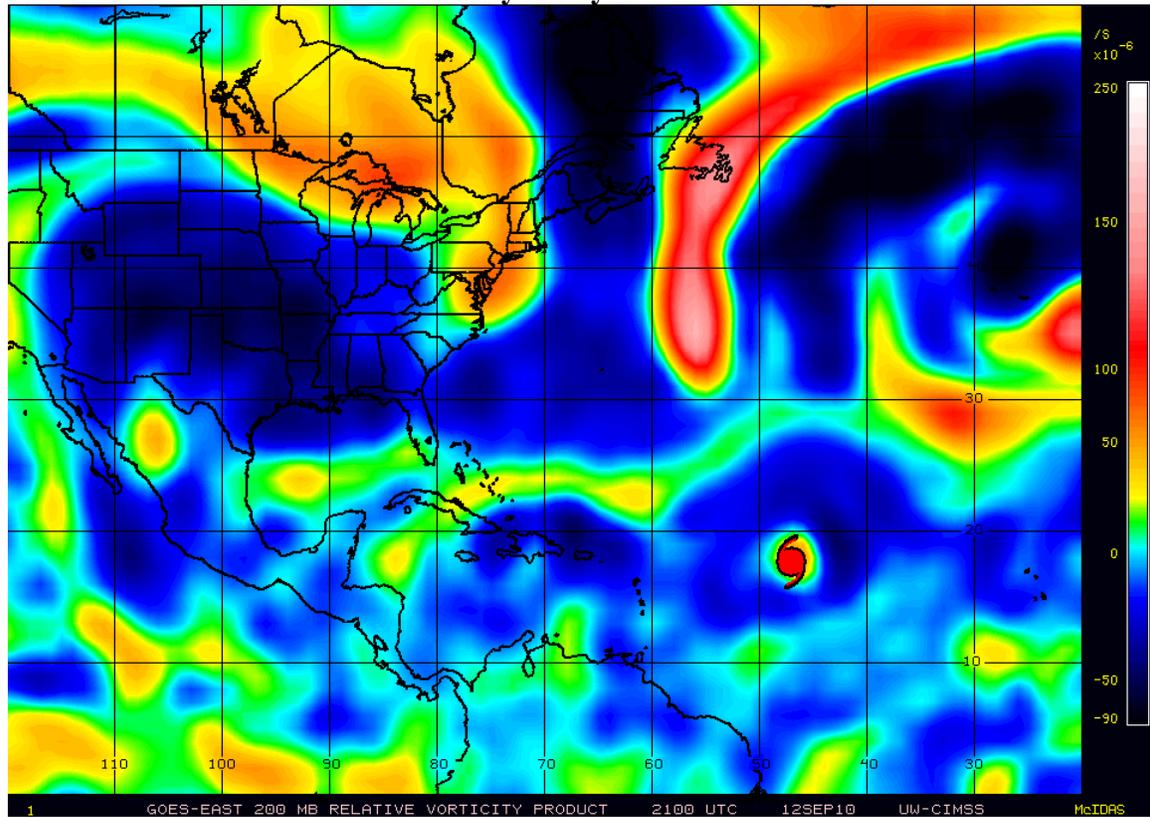
S5-1800UTC METEOSAT IR



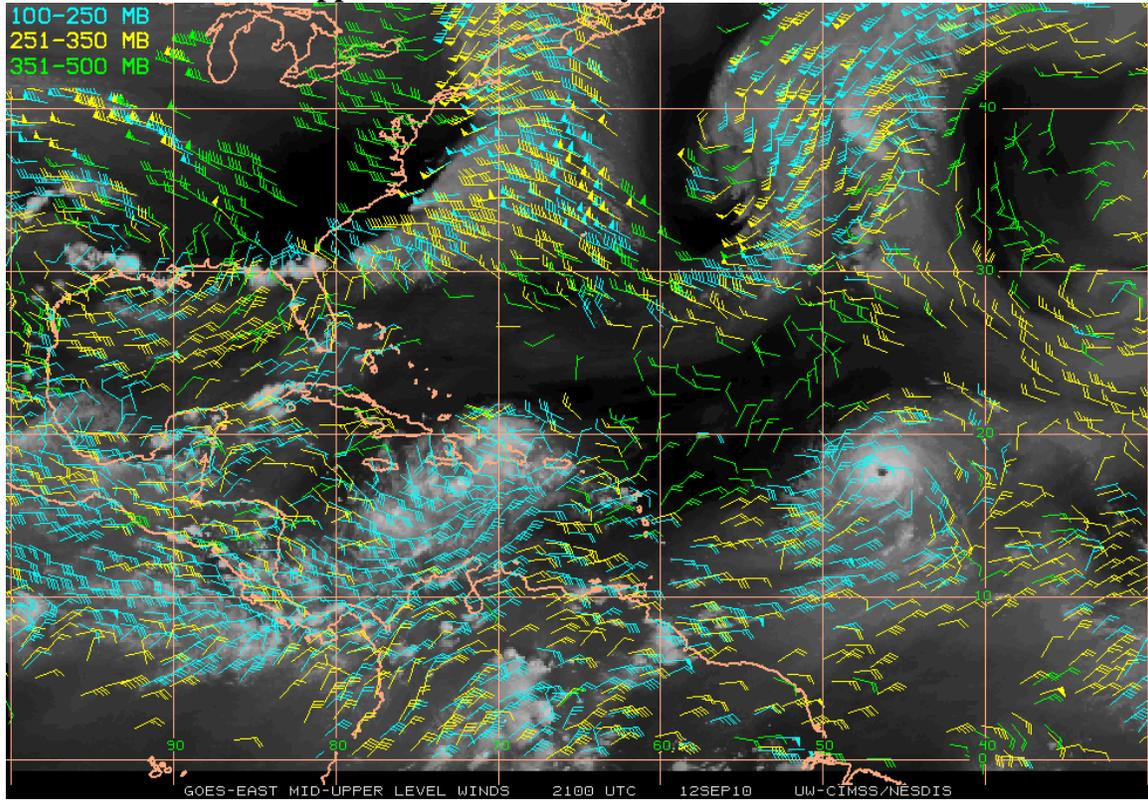
S6-0000UTC TPW and Pouch Locations



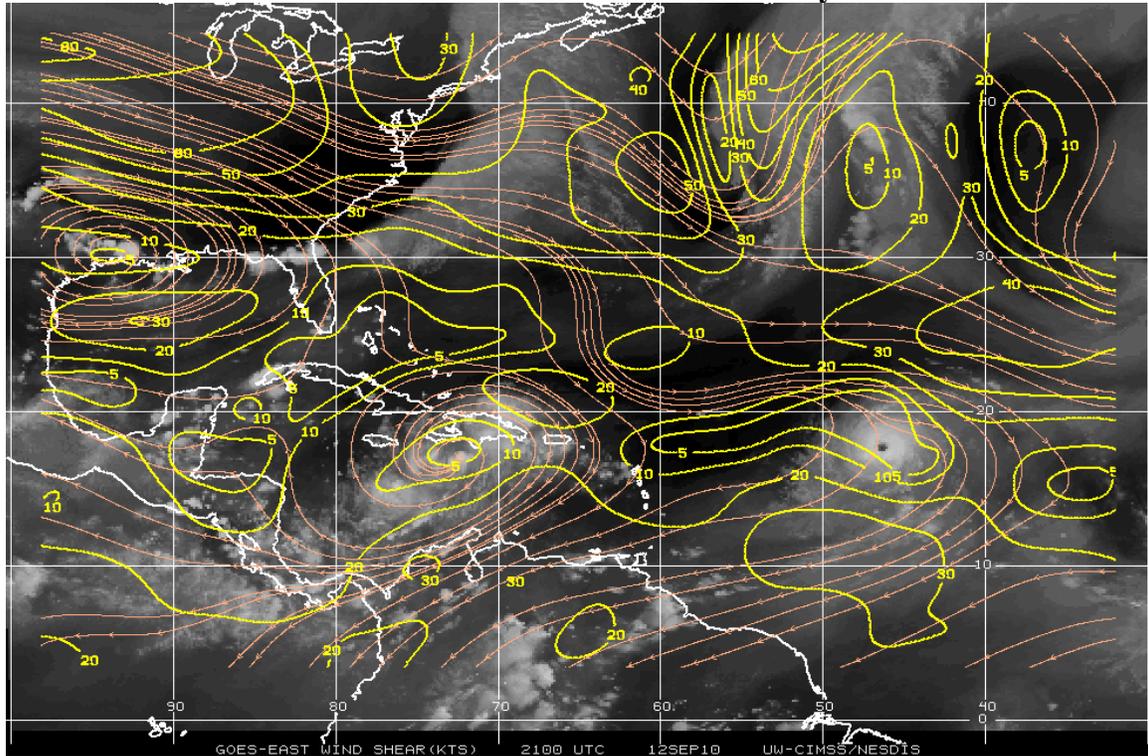
S7-2100UTC CIMSS 200mb Vorticity Analysis



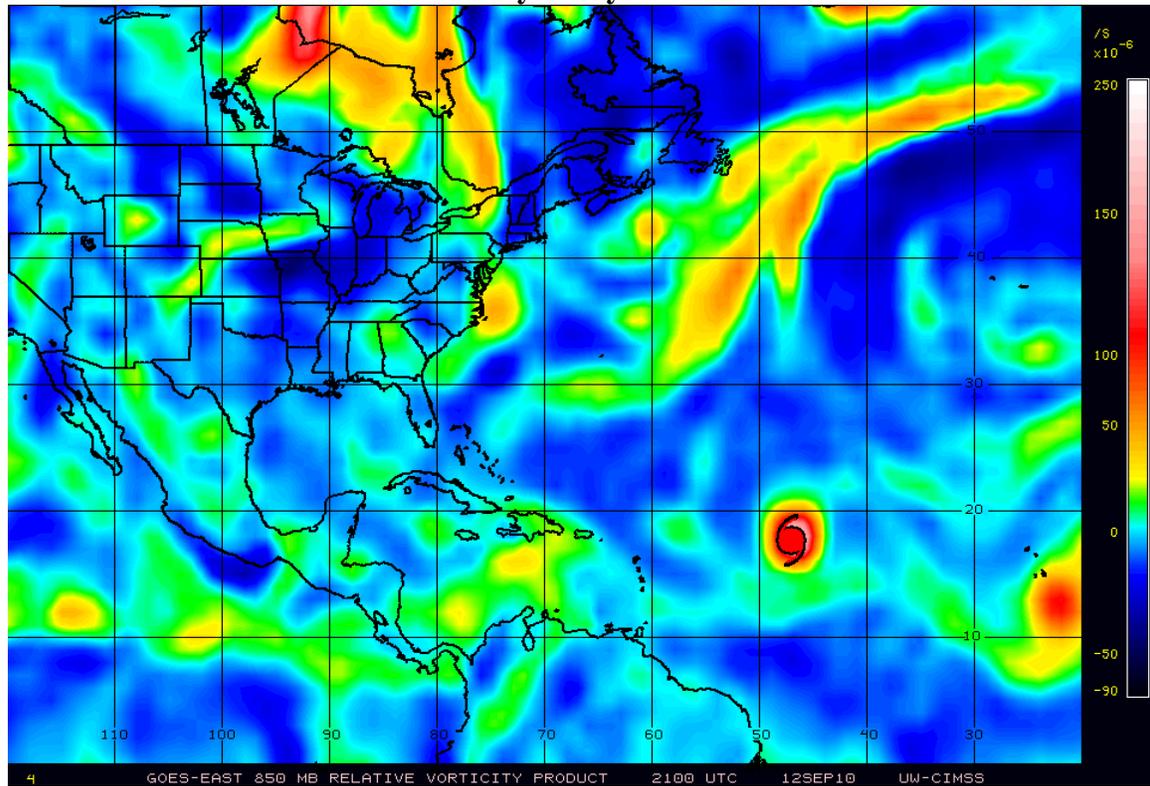
S8-2100UTC CIMSS Upper Level Wind Analysis



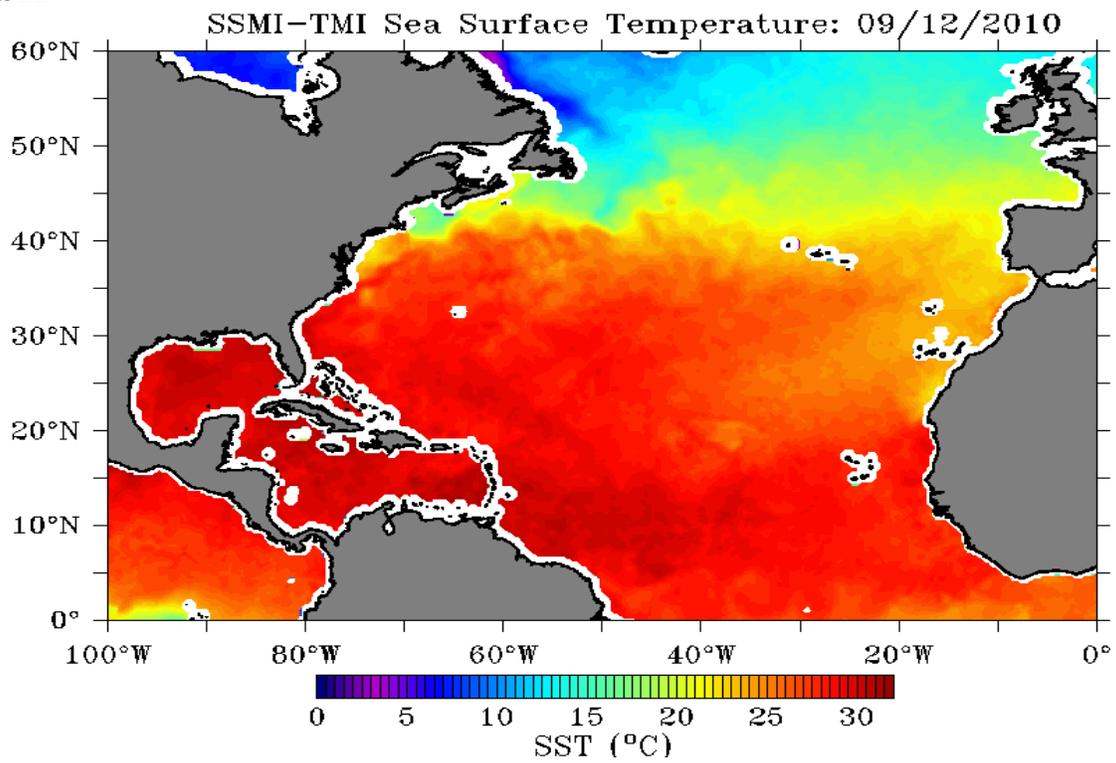
S9-2100UTC CIMMS 850-200mb Vertical Wind Shear Analysis



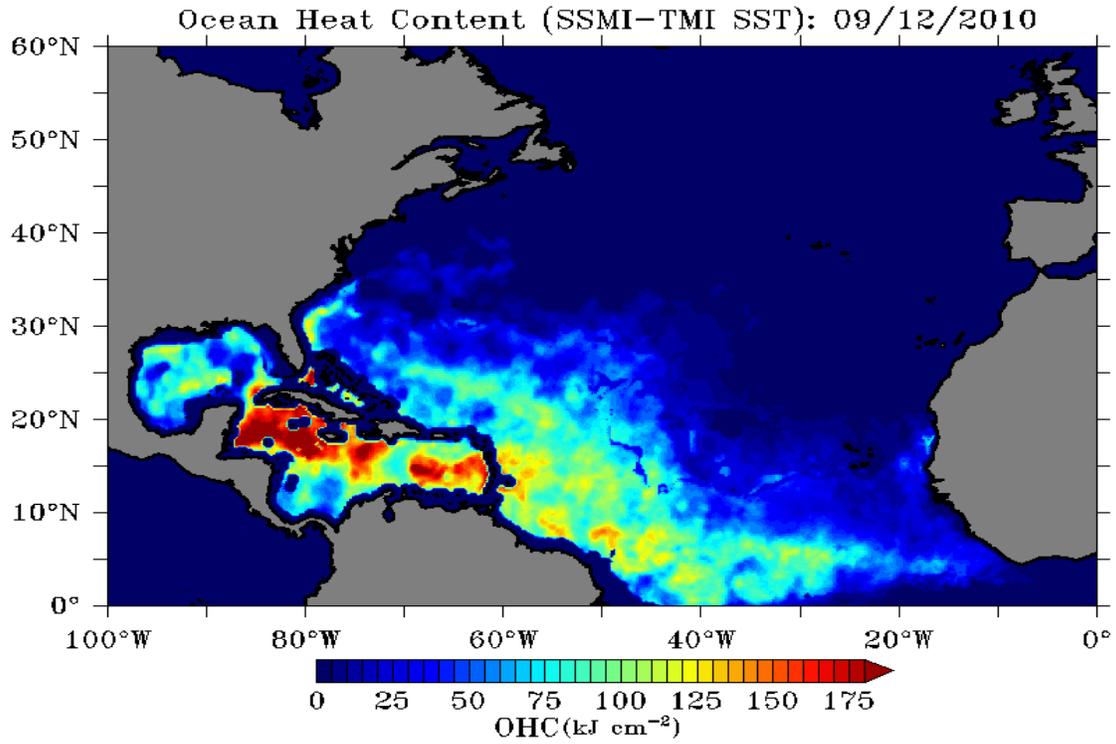
S10-1200UTC CIMSS 850mb Vorticity Analysis



S11

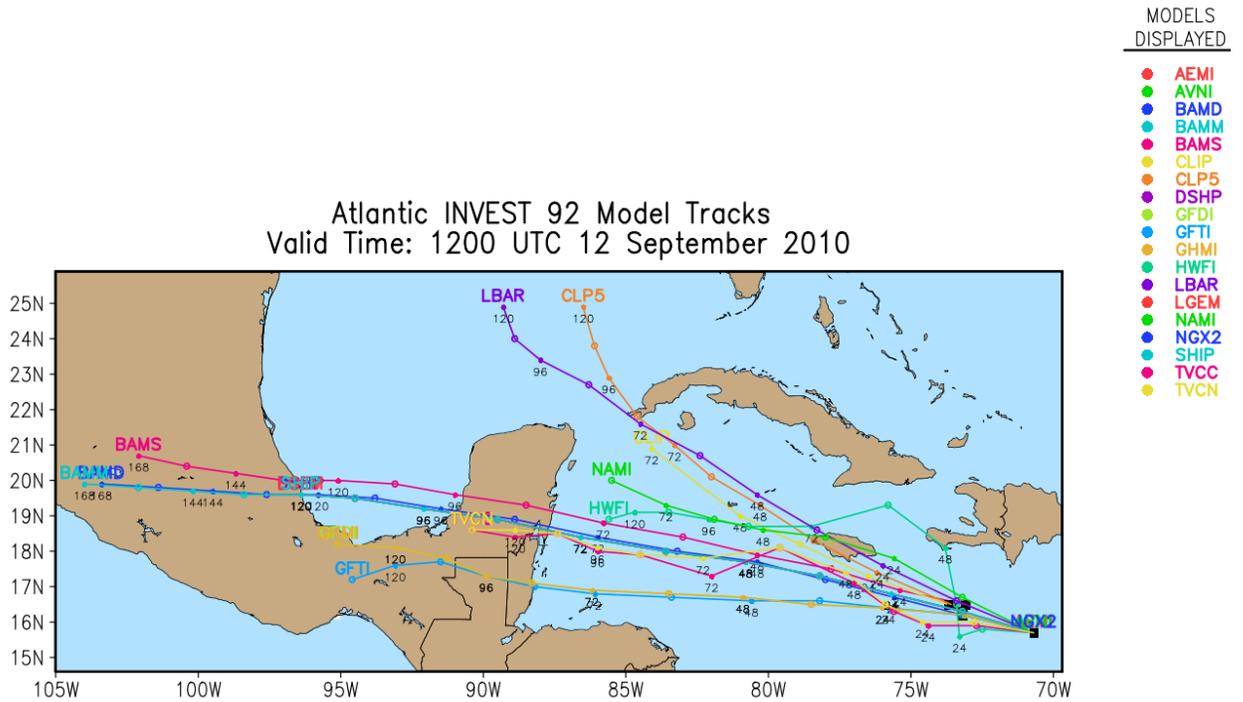


S12



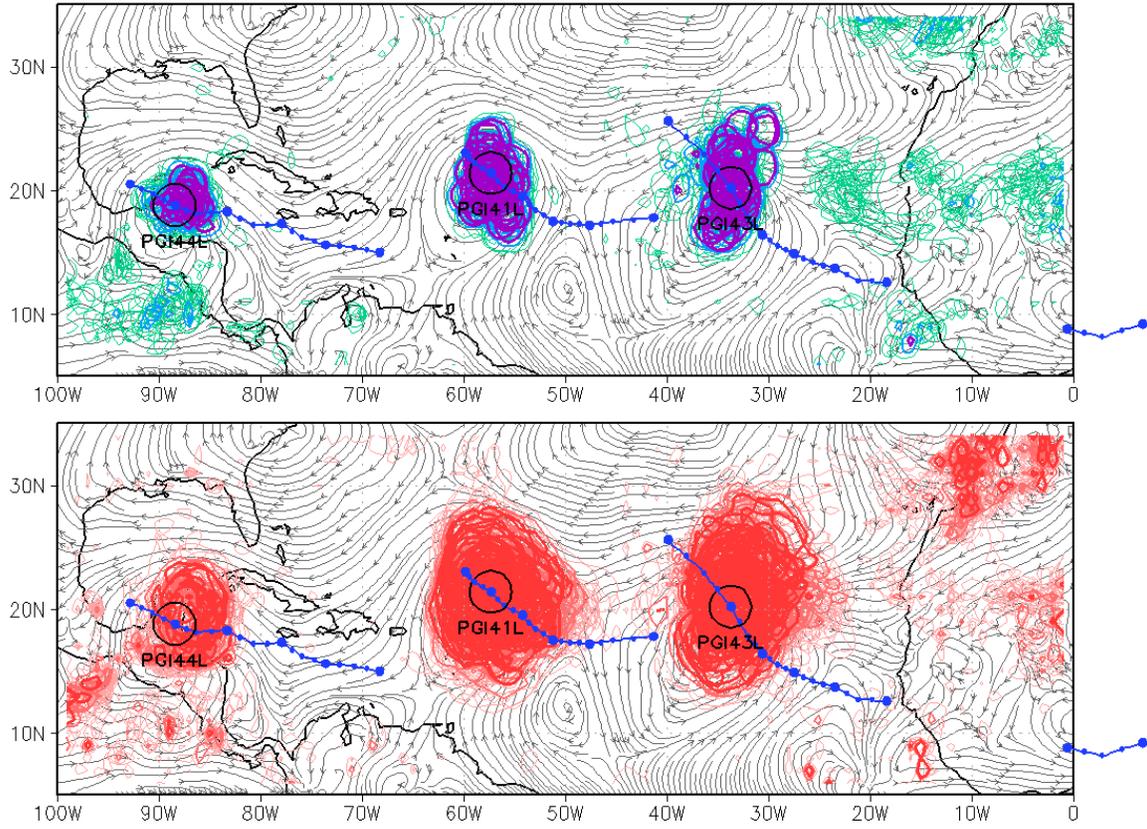
PGI-44L/AL92:

44A



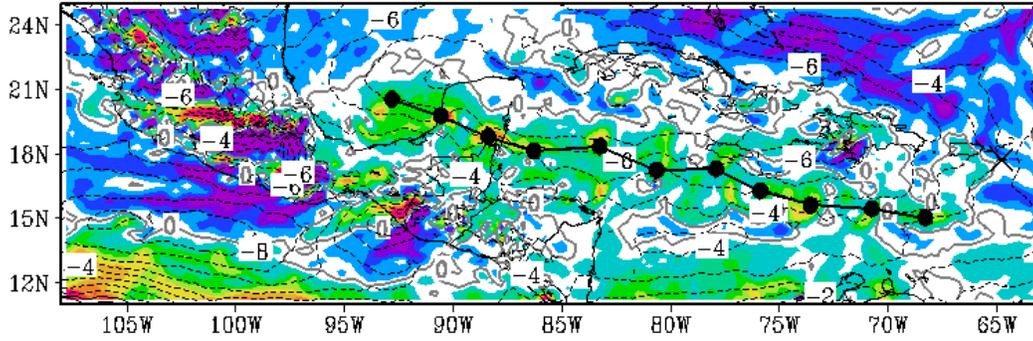
44B

Gray: ECMWF 96-hour CTRL streamlines at 850 hPa. Init. 2010091200, Valid 2010091600.
Color: Spaghetti contours of ZETA x 5e-5 s^-1 and OW x 2e-9 s^-2. 50 members.



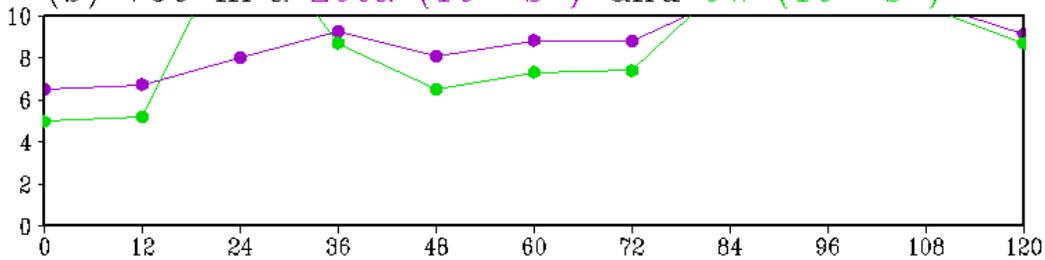
PGI44L: 5-Day Forecast Based on ECMWF
 Initialized at 2010091200

(a) Track, 700 hPa U and Zeta (5-day average)

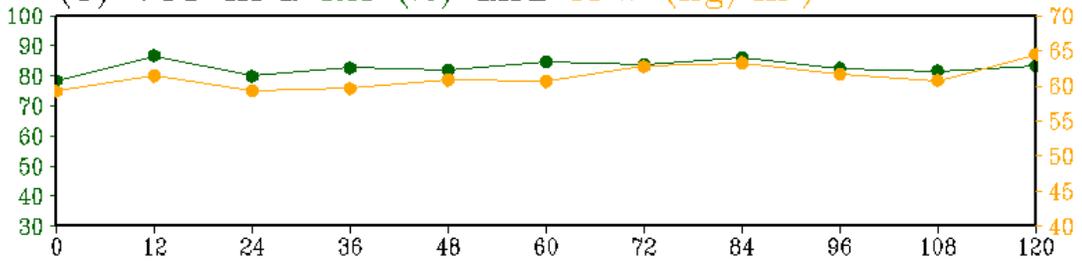


3x3 degree box averages following the pouch:

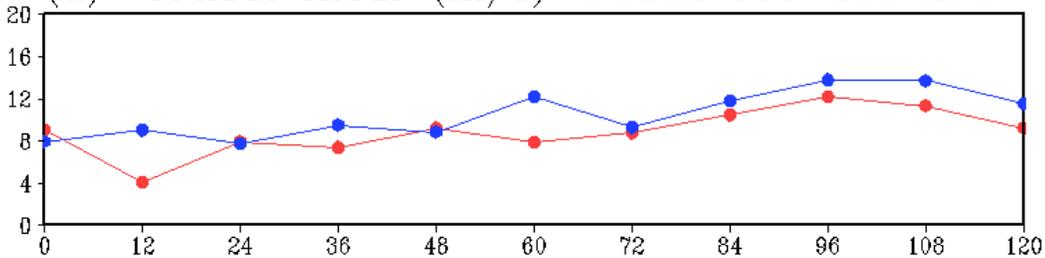
(b) 700 hPa Zeta (10^{-5} s^{-1}) and OW (10^{-9} s^{-2})



(c) 700 hPa RH (%) and TPW (kg/m^2)



(d) Vertical shear (m/s)
 Deep 200-850 hPa
 Pouch 500-850 hPa



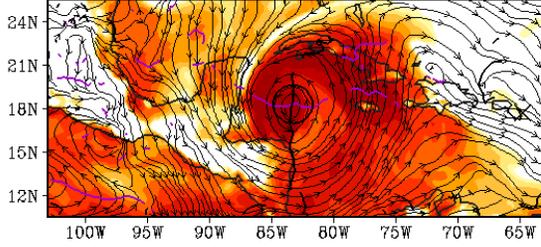
44D

PGI44L: 2010091200 (72h ECMWF valid at 00Z15SEP2010)

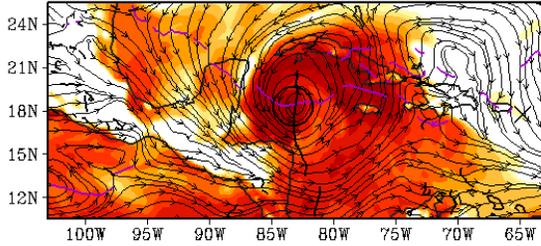
Level Tracked: 700 hPa

Comoving ($C_p = -6.5$ m/s)

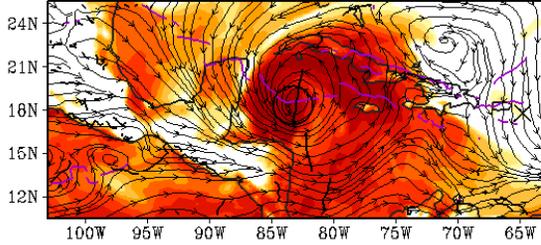
700 hPa Streamlines and TPW kg m^{-2}



850 hPa Streamlines and TPW kg m^{-2}

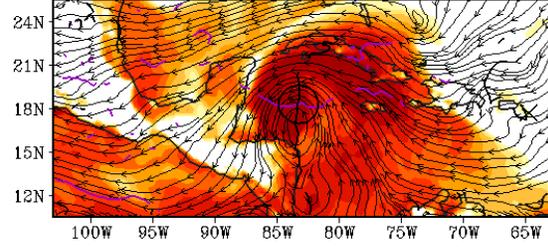


925 hPa Streamlines and TPW kg m^{-2}

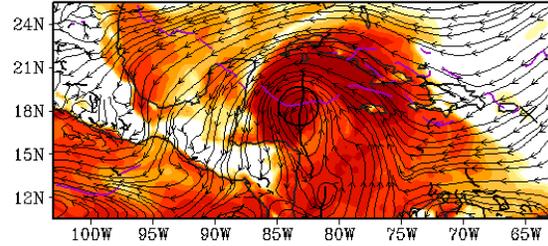


Earth-relative ($C_p = 0$ m/s)

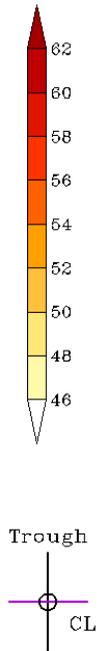
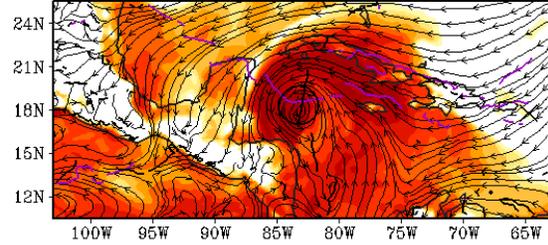
700 hPa Streamlines and TPW kg m^{-2}



850 hPa Streamlines and TPW kg m^{-2}

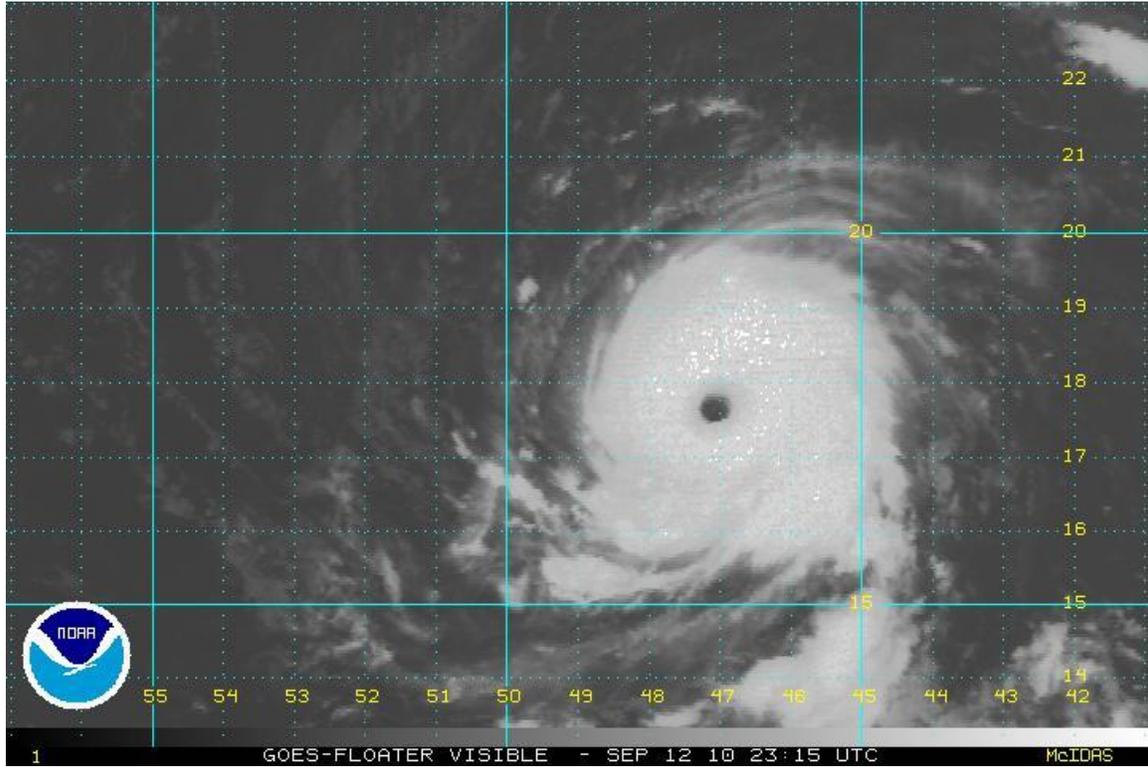


925 hPa Streamlines and TPW kg m^{-2}

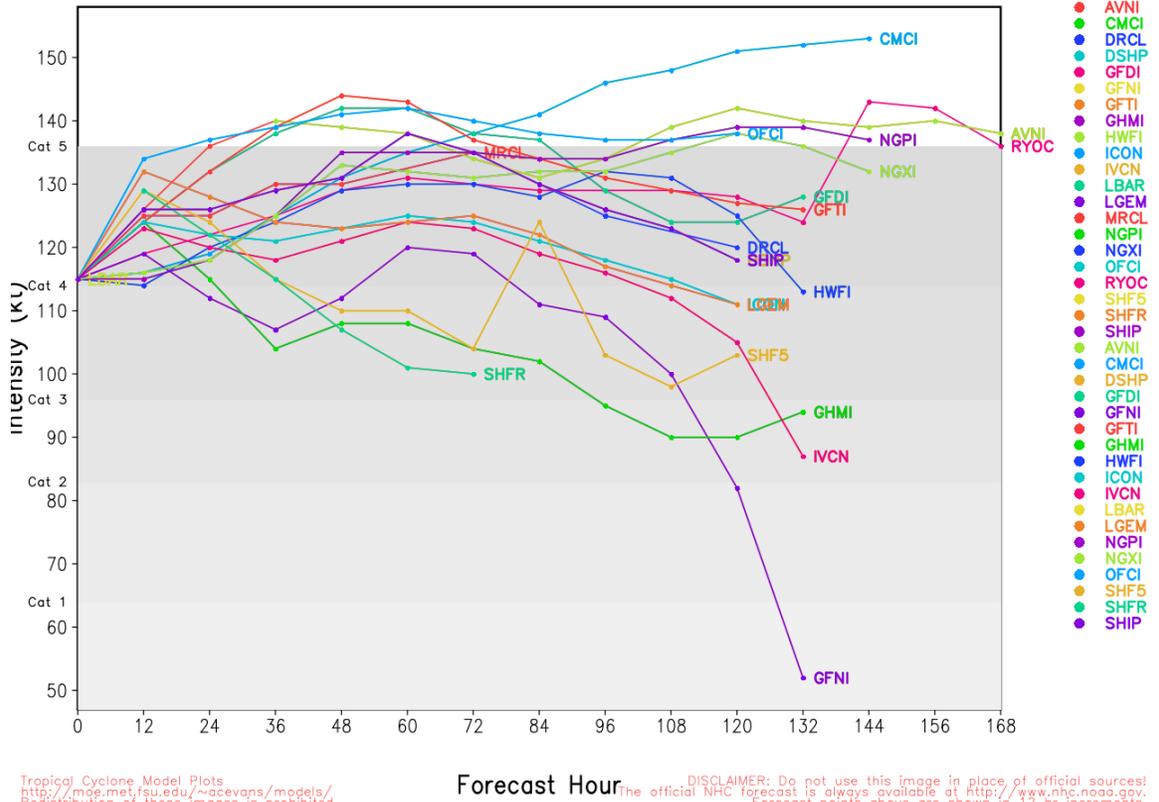


PGI-42L/Igor

11

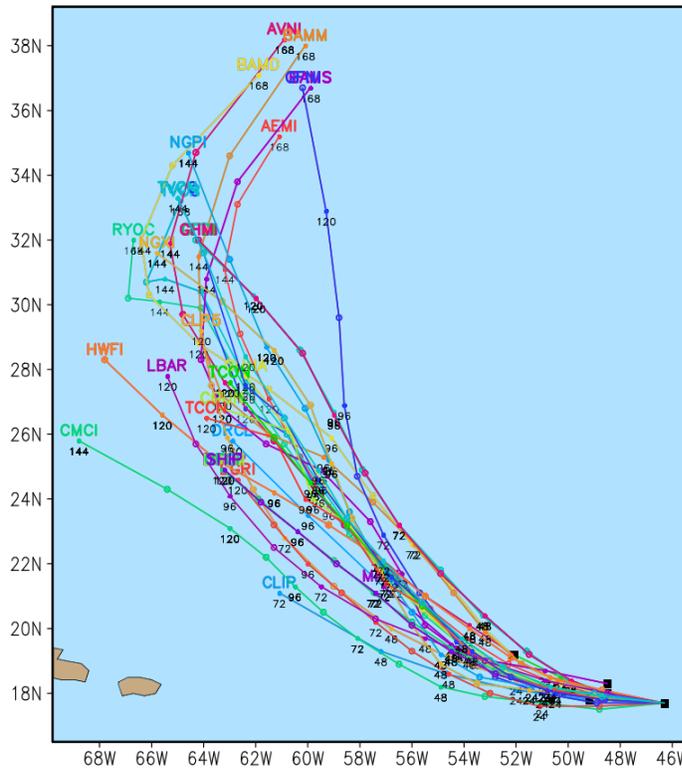


Atlantic HURRICANE IGOR Model Intensities
Valid Time: 1800 UTC 12 September 2010



Tropical Cyclone Model Plots
<http://mog.met.fsu.edu/~acevans/models/>
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Atlantic HURRICANE IGOR Model Tracks
Valid Time: 1800 UTC 12 September 2010



MODELS
DISPLAYED

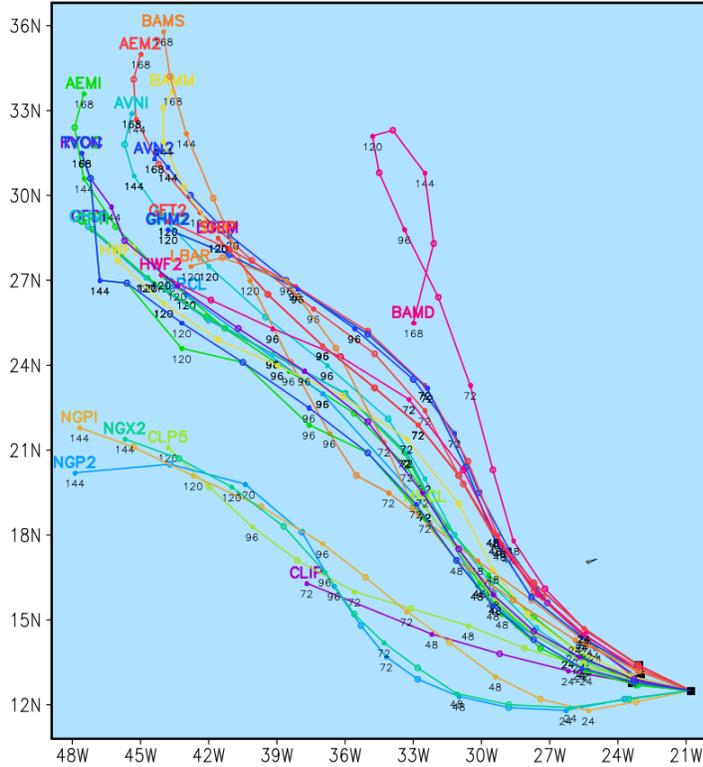
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- AVNI
- BAMD
- BAMB
- BAMS
- CGUN
- CLIP
- CLP5
- CMCI
- DRCL
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- EGRI
- GFDI
- GFNI
- GFTI
- GHMI
- GUNA
- HWFI
- LBAR
- LGEM
- MRCL
- NGPI
- NGPI
- OFCI
- RYOC
- SHIP
- TCCN
- TCON
- TVCC
- TVCN
- AVNI
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- LGEM
- MRCL
- NGPI
- NGPI
- OFCI
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- SHIP
- TCCN
- TCON
- TVCC
- TVCN

Tropical Cyclone Model Plots
<http://mog.met.fsu.edu/~acevans/models/>
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Atlantic TROPICAL DEPRESSION TWELVE Model Tracks
Valid Time: 1200 UTC 12 September 2010

MODELS
DISPLAYED

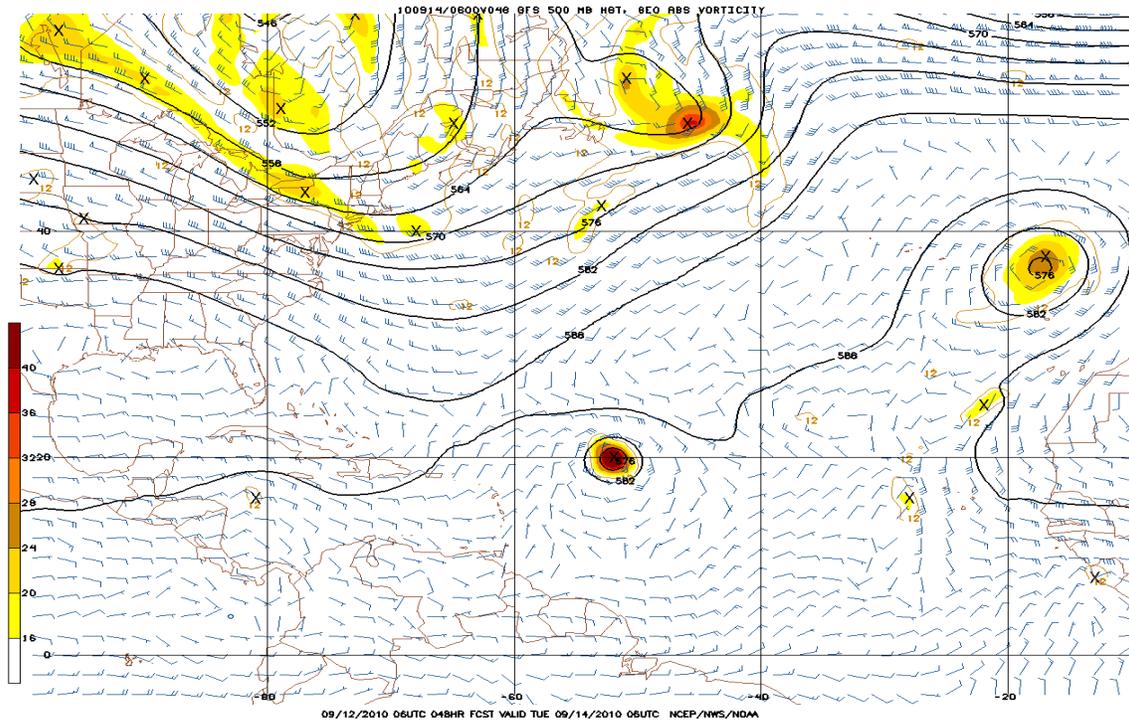


- AEM2
- AEMI
- AVN2
- AVNI
- BAMD
- BAMS
- CLIP
- CLP5
- DRCL
- DSHP
- GFD2
- GFDI
- GFT2
- GFTI
- GHM2
- GHMI
- HWF2
- HWFI
- LBAR
- LGEM
- MRCL
- NGP2
- NGPI
- NGX2
- RYOC
- SHIP
- TVCC
- TVCN

Tropical Cyclone Model Plots
<http://moj.met.fsu.edu/~acevans/models/>
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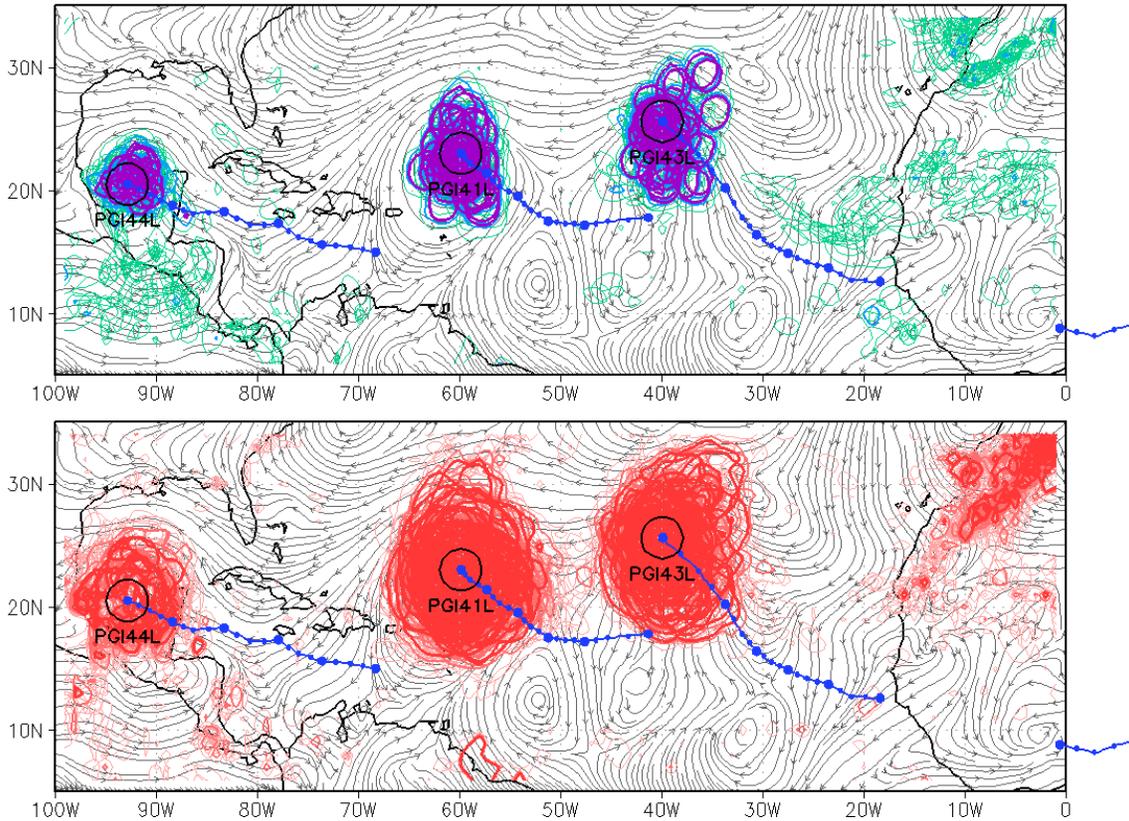
DISCLAIMER: Do not use this image in place of official sources!
 The official NHC forecast is always available at <http://www.nhc.noaa.gov>.
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43B

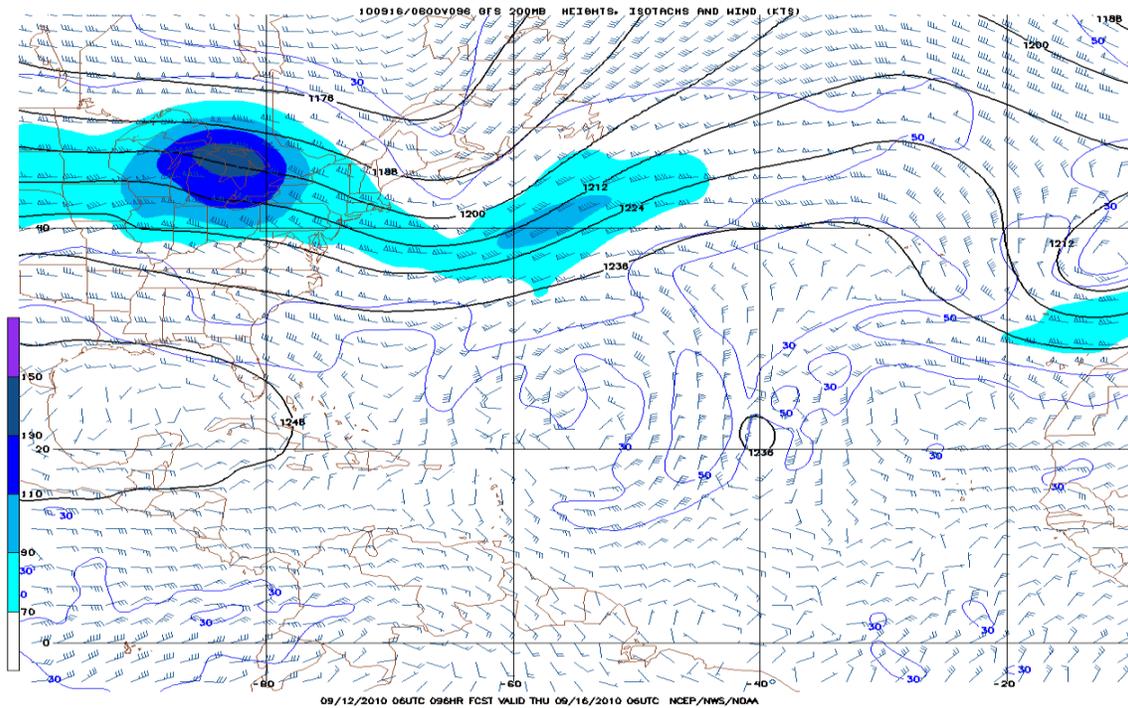
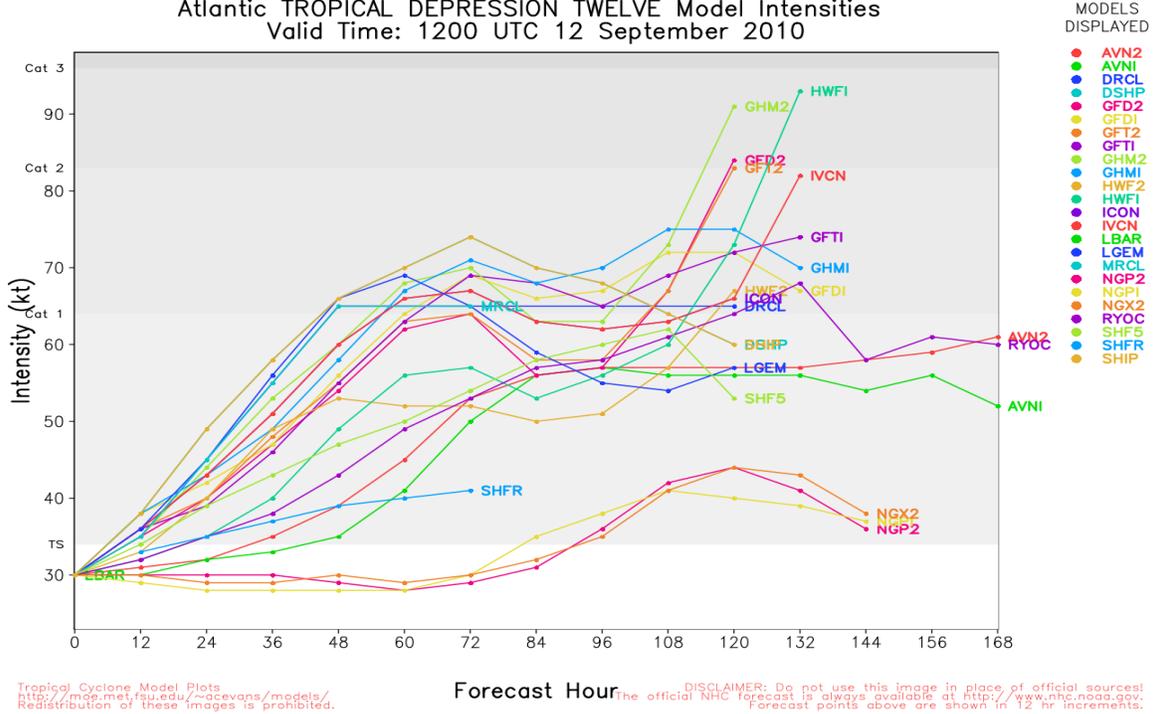


43C

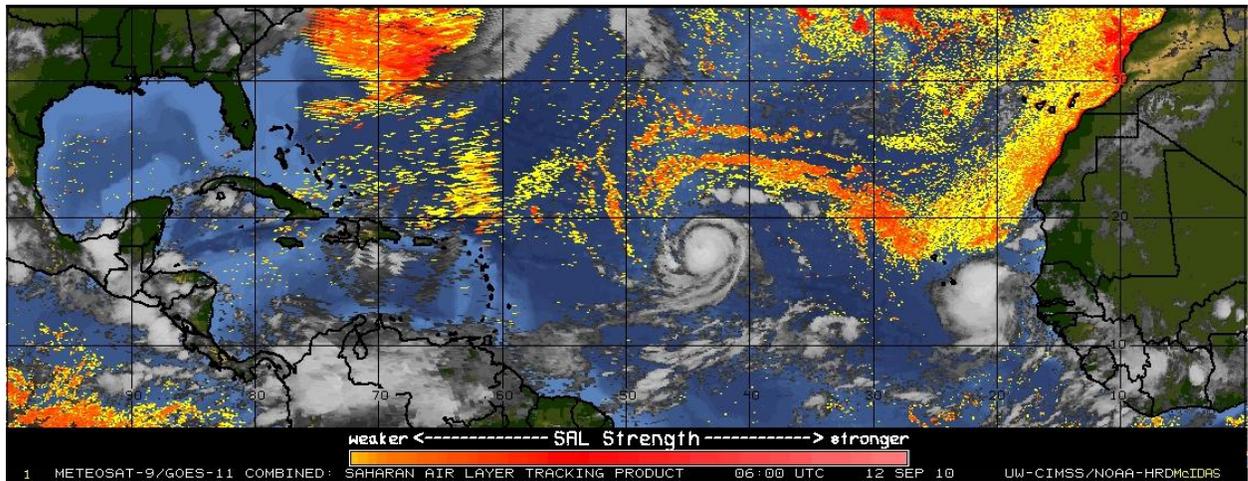
Gray: ECMWF 120-hour CTRL streamlines at 850 hPa. Init. 2010091200, Valid 2010091700.
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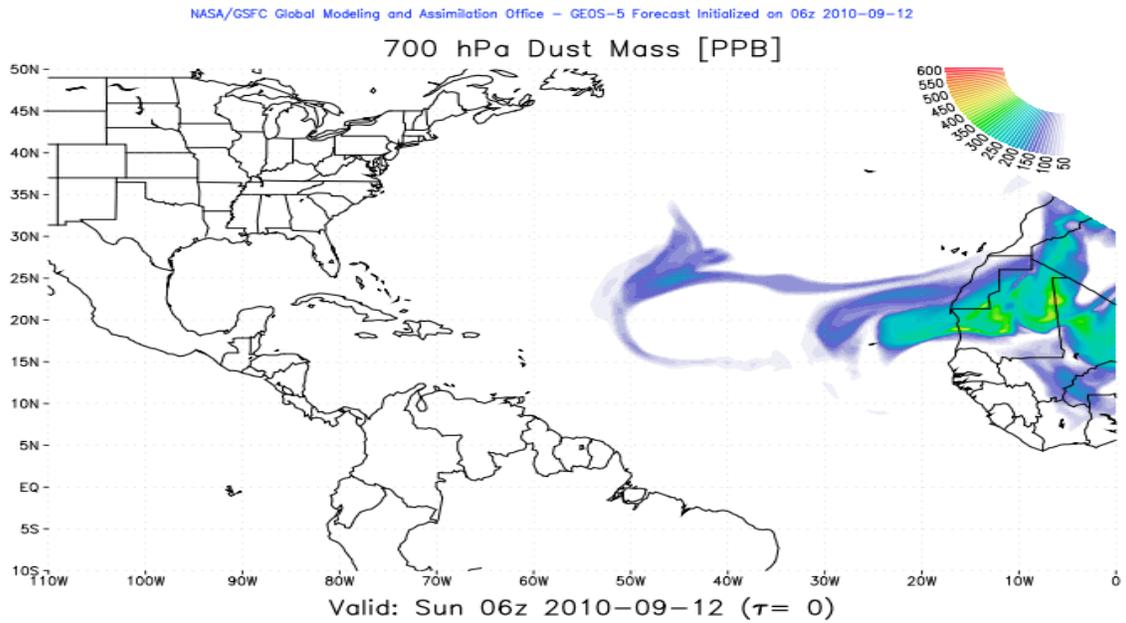
Atlantic TROPICAL DEPRESSION TWELVE Model Intensities
Valid Time: 1200 UTC 12 September 2010



D1

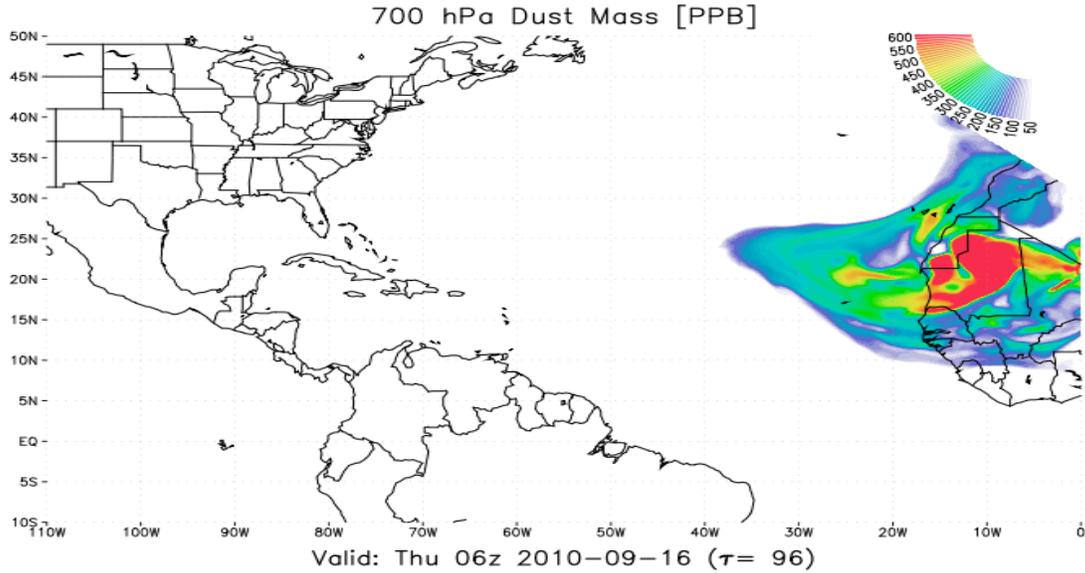


D2



D3

NASA/GSFC Global Modeling and Assimilation Office - GEOS-5 Forecast Initialized on 06z 2010-09-12



D4

NASA/GSFC Global Modeling and Assimilation Office - GEOS-5 Forecast Initialized on 06z 2010-09-12

